

ELECTRICAL POWER

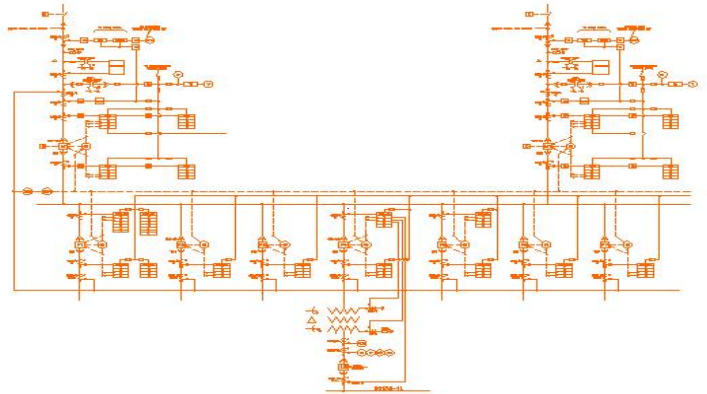
Power System Analysis – Protective Device Coordination – Transformer/Breaker/Switchgear Installations – Microprocessor-based Relays – Cogeneration – Arc Flash Protection - Motor Control Center Installations – Standby Power & Emergency Generation

Utility

Pharmaceutical

Chemical

Everyone expects electrical power 24 hours a day, 7 days a week, 52 weeks a year. Customers lose hundreds of thousands of dollars a day if a plant is off-line due to an electrical interruption. KTR's electrical engineers understand a client's expectations and provide expertise in keeping your facility on-line.



Industrial

Representative Electrical Power Experience

Indoor 35 kV Metalclad Switchgear

Microelectronic

Responsible for the engineering design of electrical systems to support a new 34.5 kV Substation. Project consisted of the physical construction of installing new conduit, trays, vaults, duct banks and cable to the new 34.5 kV outdoor switchgear. Project included modifications to PECO's metering, SCADA, protective relaying, interlocking and monitoring and control circuits. Detailed scope / sequence documents were developed to allow work to be performed with no plant outages and with minimal time duration of operation on a single incoming service. Performed load studies, short circuit studies, and protective device coordination study.

Institutional

Commercial



Upgraded 230 kV Substation Yard

Utility

Responsible for the design, specification, and commissioning support for the installation for two new 60 MVA transformers. Design included new circuit switchers on the 230 kV side and 115 kV low side bank breakers. Relay settings were provided for GE microprocessor-based relays (transformer differential, bus protection, transmission line protection. All schematic and interconnection drawings were created for this vendor.

Pharmaceutical

New Outdoor 35 kV Substation Yard

Chemical

Responsible for the design, specification, and construction support for a 34.5 kV metalclad switchgear unit and associated building. The initial step included developing the specification for various switchgear manufacturers to bid, evaluation and selection of quotes, and notifying the successful bidder. All schematic and interconnection drawings were created for this vendor. All microprocessor-based relay settings were developed along the associated TCC curves, short circuit and arc flash study. The job included commissioning/construction support during the installation phase.

Industrial

Staged Demonstrations on Mannequins for PPE Requirements

Microelectronic

Performed staged demonstrations on mannequins determining the incident energy individuals would be exposed to during arcing faults. Determined the fault current and time duration to determine the appropriate personal protection equipment (PPE) individuals must wear during various arcing conditions. Tried to verify the IEEE 1584 calculations and NFPA 70E standard for Electrical Safety in the Workplace.

Institutional

Medical Products Manufacturing Facility

Commercial

Engineered and designed all electrical systems for a 50,000 SF medical products manufacturing facility. The project included 2000 KVA transformer, 400 KW emergency generator, lighting, emergency lighting, fire



pump, fire alarm, card access, security and telecommunications / LAN cabling systems. Utilized a programmable logic controller (PLC) for a sterilizer process emissions control system and material handling controls system. Provided construction observation and coordination.

Utility

New Outdoor Main Substation and Associated Unit Substations

Electrical power system study and documentation of the 500,000 SF complex including an outdoor main sub and nine unit substations. Project included field tracing, developing CAD single line diagrams (77 total drawings) and performing fault current and coordination studies using DAPPER and CAPTOR software. Produced 38 coordination curves and 20 lists of protective relay/switchgear breaker settings, which covered existing settings and recommended changes. Analyzed the 15kV duct bank feeder capacities. Provided a formal report including the studies and identifying underrated equipment, mis-coordination, NEC violations and recommended corrections.



Pharmaceutical

Chemical

Industrial

Arc Flash Study For Employees

Provided eight hour training sessions for over 200 employees who required Arc Flash training. Training included OSHA regulations, IEEE calculations, NEC, and NFPA 70E standards as well as PPE requirements.

Microelectronic

45 MW Generator Trip Evaluation

Provided recommended relay setting changes after multiple trips on differential protection for external faults.

Institutional



Commercial

Protective Device Coordination Study for 34.5 kV System

Provided a short circuit study, TCC coordination study, for a 1000 bus system. System voltages were from 5 kV to 34.5 kV. The study involved both microprocessor-based relays and electromechanical relays.

Utility

Switchgear Relocation

Installed new fused air interrupter switches for 15 kV switchgear and relocated the switchgear to another location to refeed other systems at 12.47 kV. Replaced the transformer in unit substation, added four new unit substations and refeed loads to convert from 4800V to 12470V. Cut through an existing underground duct bank and built a new manhole around it. Reused existing cables in that duct bank and various other duct banks throughout the complex, installed 6" conduit and 750 MCM 15 kV cable from manholes through buildings and across trestle system and cut and spliced new and existing cable to reconfigure the 15 kV distribution system. The loads on the noted switchgear and 15 kV switchgear in various other buildings were redistributed between the two (2) main substations located at opposite ends of the complex of buildings. The project was separated into four phases and detailed sequences of work were written to allow construction without interruption of production. Project involved fault current calculations, protective relaying analysis, interface with utility company relaying and replacement and/or resetting of relays to provide a coordinated system.

Pharmaceutical

Chemical

Industrial

Microelectronic



Protective Device Coordination Study for 5 kV System

Provided a short circuit study, TCC coordination study, for a 150 bus system. System voltages were from 5 kV to 480 volt system. The study involved both microprocessor-based relays and electromechanical relays.

Institutional

Commercial

Short Circuit and Motor Starting Studies for Petrochemical location

Utility

Provided short circuit, protective device coordination, and motor starting coordination study for renovations occurring at a petrochemical location. The renovations included moving 1500 and 2500 horsepower motors from one voltage bus to another.

New 12 kV Substation for Manufacturing Facility

Pharmaceutical

Provided associated engineering appropriate drawings and specifications for new substation. Engineering included equipment specifications, prepare one-line diagrams, review and approve vendor drawings, design and prepare substation ground system drawing including equipment ground, concrete pad ground grid, fence grounding, and lightning protection. Design also included substation fence specification drawing, area lighting specification drawing, structural support drawings for aerial cable installation of primary and secondary substation feeders, design power monitoring and interface to existing plant Ethernet system, revise existing design drawings (one-line diagrams, power distribution schedules, elementary wiring diagrams) as required to document the changes to existing equipment affected by this project. Lastly, provided a Bill of Material for required equipment.

Chemical

Industrial

Contact Person

Microelectronic

Joseph Deane, PE
610 670 6061 Ext 101

2917 Windmill Road
Sinking Spring, PA 19610

Institutional

JDeane@KTRassociates.com

Commercial